

ABSTRACT OF THE DISCLOSURE

Systems and methods to provide compact, scalable, low loss optical switches. An optical switch of this invention includes two or more directing elements, each directing element having two or more sections. Each section includes a switchable deviating element. During operation of a two element optical switch of this invention, the first section of the first element can selectively deviate in a first direction the input beam for that section. The second section of the first element can selectively deviate in a second direction the input beam for that section. The optical beams transmitted by the first element constitute the input beams for the second element. The first section of the second element can selectively deviate in a third direction, which can be the same as the first or second direction, the input beam for that section. The second section of the second element can selectively deviate in a fourth direction, which can be the same as the first or second direction, the input beam for that section. By selecting the relationship between the third direction and the first or second direction and the relationship between the fourth direction and the first or second direction, different designs are obtained. Also, multiple input switches can be obtained by either repeating the first section for half of multiple inputs followed by repeated second sections (also refereed to as a segmented design) or by interleaving first and second sections.